

Engineering Tripos Part IIB, 4C4: Design Methods (shared with IIA), 2018-19

Leader

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Lecturers

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Timing and Structure

Shared with IIA. Michaelmas term. 14 lectures + 2 examples classes. Assessment: 100% exam

Aims

The aims of the course are to:

- present useful tools for designers of all disciplines and illustrate the practical application of systems engineering and risk management techniques.

Objectives

As specific objectives, by the end of the course students should be able to:

- formulate a design problem, allowing the widest range of valid solutions.
- evaluate competing design concepts systematically.
- use techniques such as quality function deployment, and various creative methods.
- search for ways in which a design can fail, and assess likelihood of failure.
- appreciate how basic evaluation techniques can be applied to a complex design.
- appreciate how decisions regarding product architecture influence performance.

Content

Design Tools (8L)

Introduction to the design process; problem formulation; methods of searching for solutions; techniques for design evaluation; guidelines for embodiment design.

Systems Engineering (3L)

Introduction to systems engineering; system decomposition, integration and evaluation; Dependency Structure Matrices.

Risk Management (5L)

Introduction to risk management; rework; risk analysis; probabilistic design.

Booklists

Please see the [Booklist for Group C Courses](#) [3] for references for this module.

Examination Guidelines

Please refer to [Form & conduct of the examinations](#) [4].

UK-SPEC

The [UK Standard for Professional Engineering Competence \(UK-SPEC\)](#) [5] describes the requirements that have to be met in order to become a Chartered Engineer, and gives examples of ways of doing this.

UK-SPEC is published by the Engineering Council on behalf of the UK engineering profession. The standard has been developed, and is regularly updated, by panels representing professional engineering institutions, employers and engineering educators. Of particular relevance here is the ['Accreditation of Higher Education Programmes' \(AHEP\) document](#) [6] which sets out the standard for degree accreditation.

The [Output Standards Matrices](#) [7] indicate where each of the Output Criteria as specified in the AHEP 3rd edition document is addressed within the Engineering and Manufacturing Engineering Triposes.

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Links

[1] <mailto:pok21@cam.ac.uk>

[2] <mailto:pok21>

[3] <https://www.vle.cam.ac.uk/mod/book/view.php?id=364101&chapterid=51681>

[4] <http://teaching.eng.cam.ac.uk/content/form-conduct-examinations>

[5] <http://www.engc.org.uk/ukspec.aspx>

[6] <http://www.engc.org.uk/standards-guidance/standards/accreditation-of-higher-education-programmes-ahep/>

[7] <http://teaching.eng.cam.ac.uk/content/output-standards-matrices>